CLAIMS:

1. A production method of an SiC monitor wafer having an ultra-flat and clean surface comprising the steps of:

depositing SiC of crystal system 3C on a substrate by a CVD (Chemical Vapor Deposition) method;

detaching the SiC from the substrate;

flattening the SiC surface by using mechanical polishing alone or in combination with CMP (Chemo Mechanical Polishing);

thereafter, irradiating the surface with GCIB (Gas Claster Ion Beam) until the surface roughness becomes Ra = 0.5 nm or less, and impurity density of the wafer surface becomes 1×10^{11} atoms / cm^2 or less to thereby produce the SiC monitor wafer.

2. The production method of the SiC monitor wafer according to claim 1, wherein:

in the CVD process, 3C-SiC crystal is oriented and grown in a direction of [100] or [110] or [111], and crystal orientation is made uniform, whereby etching rate anisotropy is avoided at the time of CMP and GCB irradiation.

3. The production method of the SiC monitor wafer according to claim 1, wherein:

in the machining step in which mechanical polishing is solely used or used in combination of CMP before the GCIB is irradiated, the surface roughness (PV value) in an area of 100 μm of the wafer surface is flattened

to 5 nm to 50 nm, and thereafter an ultra-flat surface is produced by the GCIB.

4. The production method of the SiC monitor wafer according to claim 1, wherein:

when mechanically polishing the SiC surface, a C surface of the 3C-SiC crystal is made a surface to be polished, and a larger etching rate is obtained as compared with Si surface polishing.

5. The production method of the SiC monitor wafer according to claim 1, wherein:

when the SiC surface is irradiated with the GCIB, a C surface of the 3C-SiC crystal is made a surface to be irradiated, and a larger etching rate is obtained as compared with the Si surface irradiation.

6. The production method of the SiC monitor wafer according to claim 1, wherein:

by using CF_4, SF_6, NF_3, CHF_3 or O_2 alone or a mixture gas of them as a gas of GCIB which is irradiated to the wafer surface, F radical generated on the surface is utilized to promote chemical reaction on the SiC surface and a large etching rate is obtained.

7. The production method of the SiC monitor wafer according to claim 1, wherein:

after etching is carried out by using CF_4, SF_6, NF_3, CHF_3 and O_2 alone or a mixture gas of them as a gas of GCIB which is irradiated to the

wafer surface, Ar gas cluster is irradiated to ultra-flatten the surface.